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ABSTRACT

Observational approaches used by ecological psychologists can focus on the behavior of persons or on their settings. The options for subject-centered observation are diary methods, specimen records, time sampling, and event sampling or critical incident recording. Serious limitations correlated to the time interval method, as it is often applied, include the use of precodes, creation of behavior fragments, and lack of information from the channel of the behavior stream. Consequently, ecological psychologists lean toward specimen records as their chief instrument for describing individual behaviors. Assessing settings by use of specimen records (or any other subject-centered observation) has certain clear limitations, such as (1) emphasis on psychological variables such as nurturance, rejection, geniality, etc.; (2) dependence upon the subject's motives and capacities; and (3) dependence upon the subject's experience. Therefore, ecological psychologists depend on the behavior setting as their major unit for analysis of context description. The unit is a combination of physical milieu and behavioral program with both temporal and spatial boundaries. (BI)

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Observation--of Persons and Contexts[1]

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Observation of persons and settings provides one approach to evaluation of operations. One may observe, record, and analyze events relating to the process of an intervention or to the product (outcome) of such intervention.

Direct observation of process would seem particularly appropriate since a basic, yet often neglected, requirement in evaluation is the determination of the degree to which an intervention actually occurred in the operation studied. Intuitively, it would seem that a study of "what happened" would provide more certain information if direct measures (i.e., observation), as well as indirect measures (i.e., interviews, archival data), were utilized.

Over the past thirty years, ecological psychologists have accumulated much experience with certain observational approaches. I would like to share some of the understandings ecological psychologists have gained from this experience.

As a beginning, we might consider three possible target areas when one is interested in behavior and associated events in an educational setting. A social studies lesson might serve as an example. If we begin with a particular student, a subject, we might focus upon the actions of the student; or upon the part of the lesson environment (behaviors of others, objects, etc.) which those actions contacted; or upon the lesson itself as a school subsetting. In other terms, we might center upon the action stream, the channel of that stream, or upon the setting which encloses both stream and channel but which is an entity in its own right. In this three aspect model, action and its immediate context are tightly related; in fact, it is difficult to describe many actions without also describing the channel aspects which stimulate, support, and constrain them. The setting is a larger reality to which individual behavior is coupled through the immediate context.

[1]This discussion is an expansion of remarks made for the Symposium "Skills and Strategies for Conducting Naturalistic Evaluation," Annual Meeting of the American Education Research Association, Boston, 1980.

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The development of research interests in ecological psychology tended to shift from early focus on the streams of behavior of individuals (Barker & Wright, One Boy's Day) to a centering upon settings as units of analysis (Barker & Schoggen, Qualities of Community Life); in the latter study, no subjects appear, only settings and their use by populations. A series of studies illustrating the shift is available in Barker & Associates, Habitats, Environments & Human Behavior. In our discussion of observation, this sequence of emphasis from individual behavior and immediate situations to settings will serve as an organizing idea.

Observation (& Recording) of the Behavior of Persons

The options for observation if one centers upon persons, if one is subject-centered, have been laid out by Wright's article, "Observational Child Study." The basic approaches include: Diary methods used by such early investigators as Preyer and Darwin, specimen records of the ecological psychologists, time sampling often used in behaviorist research, and event sampling or critical incident recording. Wright discusses the basic qualities of each measurement type and clearly indicates advantages and limitations of each approach. This publication, now twenty years old, is cited today as "the best available summary of various direct observation methods" (Irwin & Bushnell, 1980, p. 38). (Another thorough discussion of observational issues appears in Weick, "Systematic Observational Methods," 1968.)

Comparing Methods

Several important issues to be considered when we choose an observational approach can be illustrated if we compare the time sampling method with that of a specimen record. Again, if we were interested in behavior in a social studies lesson we might use either approach. A typical, simple time interval study might involve a coding of on-task behavior in six second intervals for a student-by-student "sweep" of the room. A specimen record approach would yield a plain English narrative account of one students' behavior and situation as this developed through the lesson. Presumably, specimen records of other students would be taken on other lesson days.

Clear advantages appear here for interval recording. Once the observation is completed, data appear in categories (e.g., on-task vs. off-task) and these are available for immediate counting and the production of findings. In the specimen record approach, narrative content will have to be unitized, then categorized, and then findings can appear. Further, the time interval approach enables a large number of subjects to contribute to the data in a relatively short time; the specimen record approach will need several lessons to achieve even a limited representative sample of students.

The economy of the time interval approach is so attractive, why would one choose to take specimen records? There are, unfortunately, a number of serious limitations correlated to the time interval method as this is often applied. Three which we wish to note are: Use of precodes, creation of behavior fragments, and lack of information from the channel of the behavior stream.

Use of pre-codes. In the usual time interval study, the observer must record information quickly and move on to the next subject or the next section of the behavior stream of the same subject. Ordinarily this must be accomplished by use of a code by which behavior can be represented rapidly--usually only a very restricted number of variables can be recorded. The actual behavior and the situations of persons are clearly multifaceted and much is missed if our codes are not comprehensive. The usual pre-code arrangement applied to complex real situations has often been less than successful. Some of us have attempted to capture leader-child "misbehavior incidents" at camp or teacher management action of first hours of the first day of school and have found that our conscientiously developed codes simply could not contain the realities presented. Use of a kind of narrative or specimen record approach became necessary. Failures with pre-codes are rarely published, but they are probably not uncommon. Pre-coding is efficient only when we know two things quite thoroughly: What, of all the many aspects of behavior and situation, are we willing to ignore? What, for the few variables selected, are the in-the-field manifestations of these variables? Because of such requirements, effective codes tend to be possible only in the later, as opposed to the earlier, phases of research experience within a particular investigative arena.

Creation of behavior fragments. The flowing yet orderly nature of behavior has been noted by psychologists dating back to John Dewey (1891). Ecological psychologists have gone beyond simply noting such qualities and have specified and quantified them. For example, the fact that the behavior stream manifests parts--little beginnings and endings, has been used to establish behavior units for that stream. One of the major of these start-end units is the episode. Episodes are units developed by respecting behavior and channel events which indicate continuance or change in behavior direction; in the sense that they are drawn from the behavior rather than imposed upon it, they are naturally occurring units. Time interval behaviors are pieces of action resulting from a "chopping" of behavior into "equal" sections without regard for such matters as beginnings, ends, or transitions. Time intervals produce what Barker has labelled "behavior tesserae" as contrasted to "behavior units" (Barker, 1963). The basic effect of use of behavior tesserae or fragments is similar to that of pre-codes--loss of information. For example, when episodic structure is wiped out by the use of interval slices, one cannot connect important sequences. If we are measuring on-task rates by time intervals, and the record shows a shift from on-task to off-task, we cannot know the behavior which was associated with the transition from one to another. On the other hand, if the behavior units are maintained, the flow between units can also be identified and analyzed. The full impact of this loss of information resulting from chopping behavior into fragments instead of letting it fall into its own units becomes more obvious when we consider a third aspect of interval coding.

Less development of information regarding the channel of the behavior stream. Actions of individuals make relatively constant contact with the channel of behavior--with that part of the environment running alongside the action. This part provides events which elicit, sustain and constrain behavior and it continually changes as the stream changes. The usual time interval study maintains information about this situational or channel side of behavior even less adequately than it maintains the beginning and end information about the action. Suppose one is using a pre-code to establish a rate for aggressive behavior. The intervals are marked: "Non-aggressive," "Non-aggressive," "Aggressive"... Since we used time intervals we really

don't know precisely when that aggression began. Behavior around the initiation of the aggressive episode is not retrievable. Further, the usual code will not tell us the channel events that might be coordinated to this change from Non-aggressive to Aggressive behavior. If we know the exact beginning point of the aggression and if we could coordinate that with simultaneously occurring channel information, we could develop a finer understanding of its meaning; we might even comprehend its immediate cause. If our channel data show that our subject's paper had been snatched away just prior to the beginning of the aggressive behavior, we see matters much differently than if no channel (situational) events provoked aggression.

The accurate coordination of channel information to stream of action is particularly necessary when we want to understand the relation between situation and behavior without benefit of experimentation. In an experiment we introduce change along an independent variable dimension. This change directs our attention to other changes, to dependent variables. We can pre-code, use time intervals, forget about channel events to some extent because we introduce the channel event of most interest here. In a naturalistic study, no change is introduced. The changes we have to exploit in learning about what is associated with what (perhaps with what causes what) are those that appear naturally in the stream and its channel; if we lose the possibility of examining these associations--particularly at the beginning and end points of behavior units--we lose the chance to infer potential causes of behavior.

The information loss involved in the usual time interval study has been perhaps overstated to illustrate dimensions more fundamental than simple time sample or specimen records. Any particular time interval study may be built in ways to limit information loss. For example, time interval studies could (they usually do not) build in methods for keeping situational information coming in as well as action information. A second important consideration is that the information loss may not be significant to the investigator. If the assessment question simply involves testing for a change in the rate of a particular variable, a study with many short time intervals will yield such a rate quickly and economically. In the case of on-task

behavior in social studies, if we desire only one simple index of involvement, the time interval works well. If we want to know what behaviors and what channel events, in what patterns, are associated with involvement, some pattern-preserving observing and recording methods are required.

Specimen Record Method for Description of Behavior and Situation

A volume by Wright titled, Recording and Analyzing Child Behavior (1967) provides the most comprehensive description of how ecological psychology approaches the observation, unitization, and categorization of individual behaviors. Important topics include: Determination of the structure of behavior (beginnings and ends, parallel episodes, etc.), the necessity for description of subject situation as well as subject action, and the yield possible in analyses of the day-long specimen records of 12 children. The work provides clear definitions and thorough illustration of methodological concepts and operations. Further examples of the specimen record approach to data collection appears in Barker, Stream of Behavior (1963). This book presents several chapters in which the qualities of children's action are heavily emphasized (e.g., emotional upsets experienced by children, characteristics of behavior of disturbed boys). More frequent in the book, however, are researches into how situations impinge upon the behavior stream of child subjects. The situations may be characterized by the role of "significant others" (mothers vs. fathers; teachers vs. parents) or by broader milieu types (e.g., home versus camp; an English town versus an American one). Since the specimen records emphasized not only what subjects did but what their surround (channel) did also, they provide rich information regarding what happened to children. For example, it was possible to show that what happened to English children involved more adult impatience and discipline than what happened to American children. A study of one boy for a full day at camp and a full day at home showed that much more sharing from both child and adult associates occurred in the camp setting. On the other hand, ambivalent emotional reactions were also common at camp. Situational setting factors relevant to the obtained differences could be found in the day records. The use of a stream of behavior approach to describe educational situations

is presented in a study by Wright titled, "Towards a Psychological Ecology of the Classroom." In this illustration of a method, the situation of a second grade boy for four hours of school was contrasted with several hours of behavior in adult-free, out-of-school habitats. From one behavioral measure, we learn that the psychological situation in school was probably stressful; restless movements were five times as frequent in school as in the out-of-school environments. A rating of the geniality of the situation in each episode showed that "everything is bad" appeared in 20% of the school episodes and only in 4% of the out-of-school episodes. The method here treats individual behavior streams as containing samples of the situations presented by two kinds of milieu. Other examples including more subjects are available. (See, for example, Gump, Schoggen, & Redl, "The Camp Milieu and Its Immediate Effects.")

The tracking method involved in specimen records might be applied to evaluation of mainstreaming. An investigator can select a sample of mainstream students and a comparison group of regular students, then record all, or representative parts of their behavior and situation in similar parts of the school. The extent to which the situations are genial (or stimulating or frustrating) for the two groups could be compared. Further, one could learn which of the school settings yielded the smallest and largest differences between the channels of the mainstream versus the regular students.

Limitations in subject-centered data for describing settings. Assessing settings by use of specimen records (or any other subject-centered observation) has certain clear limitations.

First, subject-centered approaches to contexts are likely to emphasize psychological variables: Nurturance, Rejection, Geniality, etc. But settings are not psychological phenomena, they are ecological ones; a setting is not, directly, "frustrating." For example, it may provide too few tools for the craft project at hand; in more general language it may be under-resourced. But "frustration" (like beauty) is in the eye of the beholder (i.e., subject).

A second limitation is the circularity involved when we try to describe a setting in terms of a subject's use of it. What the subject deals with, what feedbacks he receives are dependent, in part, upon the subject's motives

and capacities. So environments inferred from the channel side a subject's action become, in significant part, what the subject makes of them.

A third and related limitation to describing settings in terms of the channel sides of the behavior streams is that many users will not contact significant functioning parts of the setting. A restaurant has a dining room and a kitchen; but diners rarely enter the kitchen; yet clearly the behavior setting restuarant is heavily dependent on the kitchen subsetting. A traditional bank has times (pre 9:00 AM and post 3:00 PM) when important events occur but customers are not present. Attempts to learn about the bank as a setting could not rely, solely, on customer data.

If we are to understand contexts for behavior, we require descriptions that are relevant to, but independent of, the behavior and experience of particular subjects in the context.

Observation (and Other Methods) for Describing Settings

To ecological psychologists, the major unit for analysis of context description has been the behavior setting. The unit is a combination of physical milieu and behavioral program ("standing patterns of behavior") with both temporal and spatial boundaries. In schools, lunch time in the lunch room and academic lessons in Mrs. Jones' third grade classroom are behavior settings. An entire school is an assembly of behavior settings. An evaluation of a school could become an evaluation of its settings; their kind, their viability, their inter-relationships.

Subject Centered vs. Setting-Centered Observation

Since major constituents of most settings are persons and their behaviors, it might be assumed that observation of settings could proceed along lines similar to those employed in observing persons. But reflection will show that the observational situations targeting individuals differ from those aimed at settings. For observing individuals, the question of what part of the time-space continuum to observe and record is, in principle, easily solved. One focuses eyes and ears (or video equipment) on the person and

records the inputs and outputs that surround that person. Physically speaking, the observer can "enclose" the observed. The situation is quite different for the observer of settings. Since settings are extended in space the observer is usually enclosed within that which he proposes to observe. The question of what to observe is not so easily solved. Many of the same episodes of individual behavior, of the events and objects in the channels around these behaviors are operative. Which shall be recorded? Clearly a random sample of such episodes will not necessarily yield a description of a setting. Settings include individual behaviors but are phenomena of a different order than individual--or even group--behavior. One has to assume a different observational stance for settings. An analogy might be the difference for the perspectives of a botanist and a geographer observing the rural area. The botanist, like the student of individual behavior, examines particular trees and parts of trees; he notes individual plants; he observes close-up and in detail. On the other hand, the geographer is looking for woodlands, meadows, and streams and for their relationship. If he gets too close, we are advised that "he can't see the forest for the trees." Ideally, the geographer needs to back away from the target; he would find a plane flight circling over the area more helpful than a step-by-step examination on the ground.

Settings extend over space and time; events in both dimensions within that extension must be seen in their pattern before we comprehend a setting. Unfortunately, we cannot physically put ourselves in the looking-down-from-above stance of the geographer and, thereby, get sufficiently back from the events to see them all at once. We can, however, "stand back" from primary data taken at various points in time and space during a setting operation.

Guides to Setting Observation

One must have some questions which relate to the extended events. For example, what are the temporal and spatial boundaries of this setting? What are major internal differentiations in the program (i.e., agenda, routine change, schedule, etc.)? For what concern or social purpose is the setting maintained (i.e., religion, education, nutrition, etc.)? For whose welfare was the setting established (i.e., babies, youth, aged)?

The basic presentation of behavior setting theory and the data-generating activities that it implies appear in Barker, Ecological Psychology: Concepts and Methods for Studying the Environment of Human Behavior. A second reference, Wicker, An Introduction to Ecological Psychology provides both simplification of some of the ecological ideas and considerable illustration of how settings might be observed and measured, and a few examples of applied work with behavior setting methods. A broadened presentation of the possibilities of measuring settings will appear in Wicker, A., Assessing the Settings of Human Behavior.

In general, one receives guidance for setting observation and recording from two quite different directions. We have been discussing the first; it relates to the basic nature of the unit itself. The structure of setting provides its own variables. For example, we need to know about spatial and temporal extent, and about major internal program differentiations because these items are basic to how settings are put together. The other direction for selection of observational targets for setting derives, of course, from the investigator's questions. The two directions are related. One selects particular research or evaluation questions in terms of the basic setting properties that are involved.

Research Examples of Setting Observation

Kounin and Gump (1974) were interested in the degree of on-task behavior as this related to qualities of various nursery school lesson subsettings (teacher reads story, making things, music and motion, etc.). Among the factors involved in all settings was that of a "signal system." As children behave in the settings there are signals of varying intensity and continuity which inform them as to what to attend to, what to do. For example, in some settings a continuous signal from a single competent source runs through the setting. This signal system operates when the teacher reads a story or when a movie is shown. A contrasting signal system operates when signals are discontinuous and from less competent sources. This happens in formats of preschoolers discussing a topic. It was found that the nature of the signal system affected on-task behavior, that the on-task rates were relatively better in the continuous--as opposed to the discontinuous--signal

system. Other uses of behavior setting ideas to assess nursery school settings appear in Kounin and Sherman, "School Environments as Behavior Settings."

One aspect of a setting unit, as opposed to a unit such as a group, is the setting's inclusion of the physical milieu, its ground, enclosures and objects within its basic structure. Properties of the milieu are tightly related to qualities of the standing pattern of behavior or the programs of settings. A major recent change in many school milieux has been the introduction of open space. When the physical enclosures which ordinarily surround classroom settings are removed, ensuing changes might include changes of the programs of those classroom settings and subsettings. When we set about to study the settings in open versus traditionally designed schools (Gump, 1974), the problem of what to target was especially challenging in the open arrangement. Observers could see into four pod areas where one to three subsettings operated simultaneously. With a maximum of twelve subsettings to observe, some choices had to be made. One option was to observe a short sample of each subsetting and slowly rotate observations through the area. One lesson learned from this attempt was that it was important to track settings over time. When one starts observations in the middle of a setting, one often doesn't know what's happening. For example, an observer would scan the pod and note four children talking around a table. What was this? An off-task sociability break? A committee sharing ideas for a class event? We found that if we could follow subsettings from their initiation to their end we gained a much clearer picture of what was happening. This meant the records could be reliably coded for more variables. We found, for example, that beginnings, ends, and transitions, were only identifiable by the tracking technique.[2] The question of which

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[2]Strictly speaking, tracking a setting's operation means "keeping track." A comprehensive description of a setting actually requires less continuous on-target concentration than a full description of individual behavior where changes in direction, for children, occur at the rate of about one every 45 seconds (Wright, 1967). Changes of setting "direction" occur much less frequently and these changes are heavily concentrated in the beginning, ending, and transition stages of the setting structure. During the core of the setting, there are extended periods of steady operation. Once the observer has noted and recorded the pattern of these steady phases, he or she can turn observation, temporarily, to other matters; the observer can, for example, collect data on pupil on-task behavior (Gump, 1974).

settings to track was answered by selection of "pilot children." Since, in this system, each child eventually entered each kind of subsetting at the beginning of its operation, it was possible to have the children's "trail of subsettings" represent the aggregate of subsettings for their grade level. The observer did not use a pilot child as a subject, even as a target, but a periodically moving marker; the observational target was the subsetting as it developed around the marker. In this study, open design was associated with more subsettings actively led by the teacher (made possible by teachers in adjoining areas joining groups) and with more extended time spent in transitions from one subsetting to another.

A second use of setting observation occurred in a study by Gump and Ross, titled "What's Happening in Schools of Open Design?" A systematic assessment was made of 21 schools with varying degrees of physical openness. The question was whether physical openness was associated with programmatic openness. We found two kinds of physical openness: Designed openness as found in school blueprints and modified openness as manifested by dividers, book cases, cabinets and other objects which were (or were not) moved into the linear spaces where, in traditional schools, walls would have appeared. Part of the direct observation of context here consisted of measurement of amount of space open before and after modification. Observation of the program of the 21 schools was more difficult. While tracking pilot children, as in the previous study, was possible it would have taken more time than was available. Direct observation in this case became more like "scouting an area" rather than true data collection. Careful notes and drawings were taken of seating, special areas, objects, and of sample bits of program operation for each teacher. The data actually used to quantify program openness came from an interview of teachers from each grade level in each school. The interviewer, now made generally knowledgeable about physical arrangements and some of the program, took the teacher through the previous day asking her to describe, in order, each subsetting that operated in her class. Data were taken regarding duration of each subsetting; the extent to which each setting provided, as a part of its basic structure, for individual differences,

and whether the setting was team taught; questions regarding other qualities of program associated with the open philosophy were also asked. As a result of the prior observations and these interviews, the extent to which openness prevailed--as a program--could be expressed in terms of setting time devoted to open operations. We did not find that open design was necessarily associated with open program; we did find that the physical aspect and the programmatic aspect of the subsetting did tend to come to terms; for example, modified openness was related to program openness. Other findings are available from the Gump and Ross reference.

For our purposes here, findings are not as important as ideas about observational methods. We become aware that settings often have such an extended span that an evaluator or investigator cannot be present at all important portions. However, other persons are present and do observe events. Properly dealt with, these persons can become "observer informants." One aspect of being properly dealt with involves the knowledge of the interviewer. With a picture of the physical layout and typical activity within it in mind, an interviewer can help the observer-informant recall concrete times, places, persons, and events.

It is also essential that the informant be dealt with as a substitute observer and a research colleague, not as a subject. In this type of interviewing we are not interested in opinion, in projection of feeling, in the "meaning" of the events for the respondent. Instead we want an objective recounting of events. One help to such a recounting is to ask informants to picture in their minds what actually happened. Another aid to objectivity is use of questions which do not call for summations but for specifics. (It can be assumed that summary statements invite respondent bias.) For example, we would not ask, "How long does it generally take for your children to get from one activity to another?" We would ask, "Yesterday, when coming in from recess, what was the approximate time from the recess-ending bell until most children were seated and ready?" And then we would continue with other questions about transitions between specific settings. (Clearly, an evaluator cannot ask questions of the required specificity if he or she does not have concrete observational experience in the arena investigated.)

At the outset, we noted that there are three aspects to the observation of persons and contexts. The stream of action of an individual, the channel of that action stream and the setting through which stream and its channel move. We noted that observation of contexts point to examination of either the action channel or the relevant setting. It was noted that the channel context is very much a function of an individual's action, therefore, if we are interested in how the environment operates, we cannot rely solely on data from the channel. A description of a setting, independent of subjects' behavior is required. The systematic observation and the quantitative description of settings, as opposed to individual behavior, would seem to be a useful, even necessary skill.[3] Many of the interventions to be evaluated involve settings: Classrooms, offices, staff-development workshops, teachers meetings, playgrounds and so on. Problems to be solved often appear in such settings; interventions are often applied in such settings, impacts of such interventions need to be examined in such settings. For some problems, the impact of intervention creates setting changes which then change individual behavior and experience. In fact, without a sturdy and comprehensive setting change, many interventions will be impotent. For this reason alone, setting observation and measurement are important skills for evaluators. In this larger sense, proper assessment of organizations such as schools can be seen as including an assessment of the variety, and vitality, and organization of their settings.

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[3]For a review of researches organized along a settings perspective, See Gump, "The School as a Social Situation."

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